Massachusetts Health Policy Commission
Health Care Innovation Investment Program Round 1
Challenge Descriptions

This document describes each of the eight health care cost Challenges that Applicants may seek to address through Health Care Innovation Investments (RFP HPC-Innovation-001). Each Challenge is presented with a summary of the problem and examples of models implemented in organizations across the United States that have demonstrated substantial cost savings and other beneficial impacts.

These eight Challenges were selected by the HPC because each is a persistent health care cost drivers and all have great potential for being addressed through innovative interventions implemented through collaborative partnerships. In each of these Challenges, conventional approaches have made limited progress but evidence of cost-saving potential is emerging through innovations across the nation that:

- Shift sites in which care is provided closer to patients (e.g., community- or home-based services)
- Broaden the type and role of staff providing care (e.g., community health workers, nurse scope of practice, and community paramedicine)
- Apply new technologies to coordinate and communicate (e.g., predictive analytics, decision support, or telemedicine)
- Utilize multi-disciplinary, team-based approaches
- Empower patients and caregivers to actively participate in their care
- Apply other novel and cross-sector solutions to address cost challenges
- Engage purchaser of health care coverage and services (e.g. employers) in supporting value-oriented choices by patients

The models described herein illustrate innovative approaches to achieving health care cost savings, while maintaining or improving quality of and access to health care services. They represent models whose outcomes are described in primary literature, grey literature, and published case studies, which are cited as resources throughout this document. They draw substantially from work done at UCLA Health Institute for Innovation. In support of the HCII Program's goal of catalyzing meaningful partnerships to meet patients' health needs, the highlighted models are illustrations of how diverse Eligible and non-Eligible Entities (such as civil legal organizations, health centers and clinics, visiting nurses associations, paramedicine providers, housing support organizations, research organizations, and many others) have collaborated on innovative approaches to achieve significant impacts in each of the Challenges.

These models are provided as examples to support and guide Applicants in developing highly effective, previously tested Initiatives. Applicants may adapt one or more of these example models to form their proposed Initiative but are not required to do so. Adapting or citing models described in this document does not confer an advantage to Applicants compared with proposing other models similarly supported by evidence of impact. Although many Proposals will likely be relevant to more than one Challenge, Applicants must select one of the eight Challenges to target with an Initiative. Innovations underway in the Commonwealth led by Massachusetts-based Carriers, Providers, Provider Organizations, purchasers or other innovators are not described in this document to avoid conferring the appearance of competitive advantage. Commercial products and vendors described in these models are not endorsed by the HPC and use of them in a Proposal does not confer any advantage. In most cases, those represented are not the sole product or vendor available to provide the described service; the inclusion of commercial entities is intended to describe *approaches* to innovation that may be pursued by Applicants. As described in **Section V.E.3.a** of HPC-Innovation-001, any innovation models proposed by Applicants must have been previously implemented at least once (e.g., in a hospital, health system, community, Carrier, etc.) and must be supported by evidence of the potential for achieving savings within the Implementation Period.

HCII Round 1 Challenge Descriptions and Example Models

Glossary of Terms

The below are brief definitions of abbreviations used in the following Challenge descriptions.

ABIM: American Board of Internal Medicine
ACO: Accountable Care Organization
ACP: Advance Care Planning
AHRQ: Agency for Healthcare Research & Quality
a-ICU: Ambulatory Intensive Care Unit
APM: Alternative Payment Method
CCTP: Community-based Care Transitions Program
CHF: Congestive Heart Failure
CHIA: Center for Healthcare Information & Analysis
CHW: Community Health Worker
CMS: Centers for Medicare & Medicaid Services
COPD: Chronic Obstructive Pulmonary Disease
ED: Emergency Department
EHR: Electronic Health Record
EMS: Emergency Medical Services
EMT: Emergency Medical Technician
EOL: End-of-Life
FDA: Food and Drug Administration
FQHC: Federally Qualified Health Center
HIPAA: Health Insurance Portability and Accountability Act (1996)
HMO: Health Maintenance Organization
ICER: Institute for Clinical and Economic Review
ICU: Intensive Care Unit
I-HELP: Income and Insurance, Housing and utilities, Education and Employment, Legal status, Personal or family stability
IHI: Institute for Healthcare Improvement
IOCP: Intensive Outpatient Care Program
IPA: Independent Practice Association
IRB: Institutional Review Board
IRF: Inpatient Rehabilitation Facility
LOS: Length of Stay
LPN: Licensed Practical Nurse
LTACH: Long Term Acute Care Hospital
LTSS: Long-Term Services and Supports
MAT: Medication Assisted Treatment
MRI: Magnetic Resonance Imaging
NP: Nurse Practitioner
PA: Physician Assistant
PCA: Personal Care Attendant
PCP: Primary Care Physician
PET: Positron Emission Tomography
PHQ-9: Patient Health Questionnaire-9
PMPM: per-member per-month
PPO: Preferred Provider Organization
RN: Registered Nurse
ROI: Return on Investment
SAI: Serious Advancing Illness
STAAR: State Action on Avoidable Rehospitalizations Initiative
SNF: Skilled Nursing Facility
TME: Total Medical Expenditure
VHA: Veterans Health Administration
VNA: Visiting Nurses Association

Social Determinants of Health (SDH):

Meet the social needs that impact the health of high-risk/high-cost patients

Social determinants of health (SDH), non-medical conditions such as poverty, nutrition, education, and opportunity for employment, are inextricably linked to an individual's medical and behavioral health outcomes–and play a substantially larger role than do medical factors in an individual's health.[1]

Access to affordable housing, the quality of early childhood education, and the presence of stable employment opportunities have been shown to affect health expenditures, especially for minority and at-risk populations. Characteristics such as race or ethnicity, religion, socioeconomic status, gender, age, mental health, disability, sexual orientation or gender identity, geographic location, or other characteristics historically linked to exclusion or discrimination are known to influence health status contributing to significant health care costs.[2] Populations such as homeless individuals, low-income individuals and families, and women, who bear the majority of caregiving responsibilities in the home, often face unique health care access issues that result in delaying preventative and routine treatment. When in need of care, these groups tend to rely on high-cost settings for primary care services. Socioeconomic, racial, and geographical disparities in readmission rates further indicate the importance of community drivers as part of any comprehensive solution for reducing health care costs. For example, patients living in low-income neighborhoods are 24 percent more likely than others to be readmitted to the hospital.[3]

Payers, public health agencies and foundations, and social support agencies have a role in addressing drivers of health care costs. Meeting the health-related social needs of patients requires jointly-accountable partnerships across these sectors, with linked information-sharing systems as well as aligned budgeting and evaluation metrics.[4]

To address this Challenge, a number of innovations are emerging in the field. The following highlights a selection of innovative models that have successfully demonstrated cost savings. This summary is non-exhaustive, and should be considered an illustrative resource, only.

SDH Model I: Integrated Health Care and Housing Services (Economic Roundtable in LA County – 10th Decile Project)

Target Population	Cost Impacts	Secondary Impacts
"Super utilizers" of health and social services among homeless individuals	• 72% reduction in TME • 2x ROI	• Reduced need for ED and hospitals • Increased access to cross-agency community-based services and data (including service utilization, costs, and intervention effectiveness).

Service Model

A number of providers, including hospitals and primary care providers, participated in this Los Angeles County collaborative led by the Economic Roundtable, a non-profit urban research organization. The collaborative also included housing providers and homeless service providers. The 10th Decile Project identified high-need, high-cost homeless individuals in hospitals and clinics, and provided them with immediate, ongoing, and affordable housing and services. The program developed a triage tool[5] to find the highest-need individuals within the larger homeless population, since the most expensive 10 percent of homeless people account for 56 percent of all public and hospital costs for the homeless population.

The 10th Decile Project included 2 provider teams of medical staff and social workers, 11 hospitals, 3 Federally Qualified Health Centers (FQHC), 5 interim and 6 permanent housing partners. Each hospital received training and technical assistance from the Economic Roundtable in using the triage tool, and identified high-need homeless individuals for intensive case management and housing placement. Every $1 spent on navigation, housing, and services produced a net saving of $2 in the first year, and $6 each following year. The participating FQHCs acted as comprehensive patient-centered medical homes, providing primary care through a fully integrated model that includes physical health, mental health, substance use disorder treatment, and housing supports.

The participating homelessness organizations provided permanent housing with supportive services. When participants

[1] Chiu, G. R., Araujo, A. B., Travison, T. G., Hall, S. A., & McKinlay, J. B. *Osteoporos Int, v.20.12.* (2009):2035-2047. Web.

[2] US Department of Health and Human Services. *"HHS Action Plan to Reduce Racial and ethnic Health Disparities."* 2011. Web.

[3] Jianhui Hu, Gonsahn M. D., & Nerenz D.R. "Socioeconomic Status And Readmissions: Evidence From An Urban Teaching Hospital." *Health Affairs May 2014 v. 33.5*. Web.

[4] Taylor, Coyle, Ndumele, et al. Yale Global Health Leadership Institute. "Leveraging the Social Determinants of Health: What Works?" Blue Cross Blue Shield Massachusetts Foundation, June 2015. PDF.

[5] Economic Roundtable's Crisis Indicator: http://economicrt.org/publication/crisis-indicator/

in the 10th Decile were in supportive housing, health care costs decreased significantly. These cost savings were contingent on retaining housing with the on-site support services.

Critical Success Factors

- **Collaboration across public agencies,** including health services, public assistance, social services, the justice system and supportive housing
- **Records-sharing** across public agencies for representative samples of housed and homeless residents
- **Testing and refinement of algorithms** for identifying the target population, customized to local conditions
- **Credible screening data** (based on service delivery, housing placement) available via triage tools deployed in partnering settings
- **Screening and operational data** used to improve screening tools and service delivery
- **"Housing first" and "harm reduction" models** used for high-need individuals experiencing homelessness
- **Intensive care management** and housing placement/ retention services
- **Partnership with a FQHC** or other site of comprehensive primary care
- **Proactive outreach** in clinics and hospitals to recruit members of the target population
- **Temporary housing and permanent housing alternatives ready and available**

SDH Model II: Health Connections (KentuckyOne Health)

Target Populations	Cost Impacts	Secondary Impacts
• Low-income "super utilizers" of medical services • High-risk, high-need individuals with behavioral, social and medical conditions.	• 67% reduction in inpatient charges • 29% reduction in ED visits • 77% reduction in total patient days • 35% reduction in hospital LOS	• Reduced depression rates • Improvement in clients' ability to manage their own health • Perception of care coordination improved • Increased access to PCP • Avoidance of CMS readmission penalties

Service Model

This program was developed by large regional non-profit integrated delivery system, KentuckyOne Health, in partnership with VNA Nazareth Home Care of Louisville. KentuckyOne used the LACE (length of stay, acuity of admission, condition, and emergency department visit) tool to screen, identify, and map their target population of complex patients whose poor health and complicated social situations directly impacted their health. This included the highest-cost 13 percent of all patients who generated 51 percent of all charges at one community hospital. Multi-disciplinary teams composed of RN leads, LPNs, social workers, community health workers, and peer support specialists for mental health and substance use disorder patients screened and paired with super-utilizer patients while in the hospital. Post-discharge, the program deployed VNA and in-home telehealth monitoring for support outside of the hospital for patients' medical conditions. Additionally, KentuckyOne staff helped patients address barriers to good health such as problems with transportation, lack of access to healthy food, and connection with a trusted primary care doctor. Team members attended medical appointments with patients to help them forge relationships with their doctors, and referred those who did not have access to a vehicle to medical transportation services. The program was voluntary and free for 90 days post discharge. The program initially implemented the Coleman Care Transitions Intervention model using nurses and a 30-day program of services, but found 90-day extended services were needed to realize reductions in avoidable utilization. The program incorporated the IHI STAAR tool[6] to analyze all 30-day readmissions to drive continuous improvement. Accenture assessed program and reported a positive ROI driven by major decreases in admissions, LOS, and 30-day readmissions, while contribution margin showed a loss due to decreased revenue from hospital admissions. The program has since been implemented in other hospitals in Little Rock, Seattle and Houston.

Critical Success Factors

- **Hot-spotting tools** used to map and risk-stratify "super-utilizers" with complex social needs across 4 urban hospitals
- **LACE tool** (and other risk indicators) to identify patients prior to discharge
- **Multi-disciplinary teams** working closely together to discuss issues affecting patients, including medical and social

[6] The IHI's Readmissions Diagnostic Worksheet: http://www.ihi.org/resources/Pages/Tools/ReadmissionsDiagnosticWorksheet.aspx

issues

- **Utilization of Community Health Workers**, rather than RNs, to do first assessment and accompany patients to first doctor visit
- **70 percent of enrolled clients receive traditional VNA services**, including home infusion therapy, wound care, or skilled therapy (physical, occupational, speech)
- **In-home telehealth monitoring** for high-risk patients with COPD or CHF
- **Place-based model** that works with participants in the context of their neighborhood's assets and barriers

SDH Model III: Medical Legal Partnership (Lancaster General Health System)

Target Population	Cost Impacts	Secondary Impacts
Super-utilizers of ED and inpatient services with civil legal problems	• 45% reduction in health care costs • 50% reduction in inpatient and ED utilization	• Decreased 7-day and 30-day readmission rates • Improved population health • Increased hospital capacity

Service Model

Lancaster General Health in Pennsylvania, in collaboration with the National Center for Medical Legal Partnership, developed a medical-legal partnership pilot program integrating a lawyer from a non-profit civil legal aid organization into their hospital inpatient care team to simultaneously address medical health and legal concerns. It was determined that a common problem among super-utilizers of ED and inpatient services was unaddressed civil legal problems. Lancaster General's partnership aimed to assess the impact of social determinants – social, financial, and environmental – on this population's physical health by offering support beyond traditional physical health services.

95 percent of enrolled patients had two or more civil law problems impacting their health – housing and access to public benefits being the most common. Also prevalent were issues relating to domestic violence, access to health care services, and behavioral health diagnoses. The lawyer included on the care team was an expert on the Medical-Legal Partnership's I-HELP legal domains (income and insurance, housing and utilities, education and employment, legal status, and personal or family stability) who acted as an advocate for patients by providing direct legal services and by developing tools and policies to support the care team and the health system in changing system-wide practices.

The pilot program integrated legal aid into Lancaster's care structure at various levels. The team's lawyer provided legal consultations with the health care team, facilitated changes to clinic policies to address underlying problems, advocated for broader policy changes to prevent civil legal problems, and trained social workers to better observe, record, and treat patients struggling with civil legal issues. Social workers were taught about the Social Security system, standards, timelines, and resources, how to discourage inappropriate claims, and how to educate patients about their benefits. The lawyer also trained the entire care team on medical certification requirements for assisting seriously ill patients dealing with utility shut-offs, and developed a standardized certification form for Lancaster General Health to use in future. By arming the care team with tools to identify and support patients in danger of housing, employment, and nutrition instability, this pilot helped preempt situations that would otherwise have resulted in an ED visit.

The pilot results showed that only 16 percent of patients' legal problems required full legal representation, and the majority of patients involved only required indirect legal care, which they could receive from the medical team and social workers following legal training.

Critical Success Factors

- **Collaboration with a civil legal aid organization**, or legal practice with experience in the I-HELP domains
- **Multi-disciplinary patient support team** composed of social workers, nurses, physicians, patient navigators, psychologists, pharmacists, and a civil legal aid lawyer
- **Legal training for the medical care team** provided by civil legal aid lawyer

Resources

Model I:

ACA and High Utilizers Symposium, LA Community Health Project. "High Utilizers 101: 10th Decile Project Overview Triage Tools." Economic Roundtable, April 2014. PDF.

Taylor, Coyle, Ndumele, et al. Yale Global Health Leadership Institute. "Leveraging the Social Determinants of Health: What Works?" Blue Cross Blue Shield Massachusetts Foundation, June 2015. PDF.

Flaming D, Lee S, Burns P, Sumner G. "Getting Home: Outcomes from Housing High Cost Homeless Hospital Patients." Economic Roundtable, 2013. PDF.

Model II:
Health Connections Initiative, KentuckyOne Health. "An Evidence Based Community Care Transitions Intervention Program Providing Assistance to a Low Income Patient Population." KentuckyOne Health. PDF.

Inside KentuckyOne Health. "Health Connections Initiative Earns Recognition as Innovative Best Practice," July 2015. Web.

Taylor B. "KentuckyOne teams make home visits to transition vulnerable patients." Catholic Health Association of the United States. 1 November 2014. Web.

Model III:
Martin J, Martin A, Schultz C and Sandel M. "Embedding Civil Legal Aid Services in Care for High Utilizing Patients Using Medical-Legal Partnership." Health Affairs, 22 April 2015. Web.

For links to these and other resources, please see the Innovation Investments page at mass.gov/hpc

Behavioral Health Integration (BHI):

Integrate behavioral and physical health care (including substance use disorders) for high-risk / high-cost patients

Patients with one or more behavioral health diagnoses including both mental illness and substance use disorders often have higher health care expenditures and disproportionately poor health outcomes, highlighting the need for increased attention to the way behavioral health conditions are identified and treated.[7] For example, cases of hypertension in Massachusetts among Medicare fee-for-service patients with at least one behavioral health condition cost $500 more on average than those without. High-cost behavioral health patients account for a disproportionate number of hospitalizations. Beyond the costs of physical health care, the cost of behavioral health care has also grown dramatically in the past decade, increasing up to 6 percent per year, leading 45 percent of patients with untreated behavioral health conditions to cite cost as their largest barrier to receiving appropriate behavioral health care.[8]

Access to services is also a barrier for many patients seeking treatment. A study of veterans with behavioral health conditions found that living 30 minutes or more from a provider would substantially reduce how often those patients utilized the services being offered.[9] For those living in rural or low-income areas, fewer providers, longer distances, and limited transportation options are a major barrier to receiving appropriate care. Lower reimbursement rates for behavioral health services and a shortage of behavioral health providers accepting public insurance mean appropriate behavioral health care is inaccessible for many patients who need it.

Effective integration between behavioral and physical health care can create efficiencies in care delivery and improve coordination of care to reduce health care expenditures, as well as improve outcomes. Despite these benefits, addressing payment and operational barriers to provide integrated behavioral health care services in the Commonwealth has only been variably achieved.

To address this Challenge, a number of innovations are emerging in the field. The following highlights a selection of innovative models that have successfully demonstrated cost savings. This summary is non-exhaustive, and should be considered an illustrative resource, only.

BHI Model I: Tele-Mental Health (Veterans Health Administration)

Target Population	Cost Impact	Secondary Impacts
Any individuals with a mental health condition	• 40-56% decrease in acute hospital bed days	• Increased patient satisfaction • Increased access to mental health care • Increased patient willingness to seek care for mental health needs

Service Model

This program was developed by the Veterans Health Administration (VHA) in 2002, and now provides home-based telehealth services to more than 150,000 veterans annually. The scope of the VHA's tele-mental health services model included all mental health conditions, with a focus on post-traumatic stress disorder, depression, compensation and pension exams, bipolar disorder, and evidence-based psychotherapy. Significantly, while the VA program included remote in-person therapy, by far the largest proportion of patients were treated with a variety of in-home remote interactive monitoring and coaching programs that allowed more frequent support and feedback. These systems used in-home telecommunications devices to query the status of the patient and provide education and coaching on a daily basis. The program reported decreases in bed days driven by the use of in-home remote interactive coaching systems.

Tele-behavioral health programs have been developed commercially by several firms, but most provide only telephone or video interactions rather than more frequent remote monitoring and coaching through telecommunications devices or online, and have generally not reported savings in acute hospital days or ED visits. General telehealth companies that support remote monitoring and coaching for a wide variety of chronic diseases increasingly include behavioral health conditions such as depression among the chronic conditions they address.

Critical Success Factors

[7] Massachusetts Health Policy Commission. *2014 Cost Trends Report*. 2015.

[8] Kaiser Family Foundation. *"Mental Health Financing in the United State: A Primer ."* 2011

[9] Health Resources and Services Administration, U.S. Department of Health and Human Services. "Increasing Access to Behavioral Health Care Through Technology". Rockville, MD: 2012. Meeting Summary.

- **Extended availability** in evenings and on weekends, including through regional or state networks to back up local practices
- **Partnership with community agencies** such as public safety, jails, and juvenile justice services
- **Protocol-based assignment of most appropriate level of professionals** for patient needs
- **Efficient means of credentialing and administering a network** of multi-level behavioral health professionals, including scheduling, billing and reimbursement
- **Documentation and communication** of services and clinical information for patient's regular health providers

BHI Model II: Primary Care and Behavioral Health Integration (Colorado Access)

Target Population	Cost Impacts	Secondary Impacts
Medicaid patients with undiagnosed depression	• 12.9% reduction in costs for high-risk, high-cost patients • $170 PMPM savings • 26% reduction in rate of ED visits per 1000 • 69% reduction in rate of office visits per 1000 • 25% reduction in admissions per 1000 • 12% reduction in inpatient days per 1000	• Increased diagnosis and intervention for other chronic conditions • Improved population health quality • Increased long-term ROI on care management investment (improved medical outcomes; decreased cost over time)

Service Model

This model was developed by Colorado Access, a non-profit Medicaid health plan, building on two funded demonstrations: the MacArthur Foundation's RESPECT Initiative and the Robert Wood Johnson Foundation's Depression in Primary Care Project. The aim was to create a sustainable depression care management program by aligning clinical and system incentives.

Colorado Access advanced BHI by training and deploying mental health clinicians in primary care clinics as care managers. PCPs utilized the PHQ-9 tool to screen patients for depression, and referred them to the co-located mental health clinicians and a supervising psychiatrist for care management and behavioral health treatment, collaboratively with the patient's PCP. After they began screening patients, Colorado Access found that patients with undiagnosed depression were common, and that these patients had significantly higher costs of care. Colorado Access adapted their care model to focus on high-risk, high-cost members with chronic medical conditions, and trained all care management staff to complete depression screening, follow-up, and referral to behavioral health services as a critical component of medical assessments, care planning, and treatment. With this approach, they continued to train PCPs on depression care management and expanded the scope of providers screening and referring patients with depression to ensure more efficient deployment of the care management staff.

PCPs with especially complex patient cases received additional care coordination assistance, with telephone access to the health plan's supervising psychiatrist, and improved access and communication with mental health specialists. Unlike Medicaid fee-for-service, Colorado Access reimbursed PCPs for office visits billed with a mental health diagnosis, increasing the number of providers offering these services. To account for the large variation in medical costs among these patients, Colorado Access revised its risk stratification process to identify the top 1,000 patients using Kronick scores. The list was updated monthly, with patients ranked and placed in order to be assessed for intensive care management. Since the original demonstrations, Colorado Access' BHI initiative has continued to grow and integrate more BH services and provider types, including peer support coaches.

Critical Success Factors

- **Centralized care management** within the plan with contacts based on risk stratification accessible via telephone, on-site in primary care clinic, or in community-based settings
- **Dedicated care manager support** by nurses or behavioral health specialists
- **Registry of patients to track PHQ-9**, adherence to treatment, educational interventions, patients' self-management of goals and progress, case management, and patients with comorbidities
- **Risk assessment to target resources** based on cost (highest 2-3 percent), the presence of behavioral health or medical comorbidities, high-risk for non-adherence, psychosocial stressors, and treatment-resistant depression

BHI Model III: ED-initiated Buprenorphine/Nalaxone Treatment (Yale-New Haven Hospital / Yale School of Medicine)

Target Population	Cost Impacts	Secondary Impacts
Opioid-dependent patients presenting to the ED	• 2/3 reduction in hospital inpatient utilization using inpatient services (versus ~36% in the control groups)	• Increase duration of enrollment in treatment program • Decreased days of illicit opioid use per week (from 5.4 to 0.9 days)

Service Model

Yale-New Haven Hospital and Yale School of Medicine developed an ED-based Substance Use Disorder (SUD) treatment program partnering with community-based PCPs focused on patients who had identified non-medical use of prescription opioids or heroin in the past 30 days. Patients presenting to the ED with opioid dependency were given a modified Screening, Brief Intervention, Referral, and Treatment (SBIRT), which built on the traditional model to incorporate medication assisted treatment (MAT) supports. These were screening, brief intervention, ED-initiated treatment with buprenorphine or naloxone, and referral to a primary care group for ongoing buprenorphine.

The Yale model included a 10-15 minute brief negotiation interview conducted by a research associate, modified to focus on opioid use. The interview raised the subject of opioid use, provided feedback, enhanced motivation, and sought to negotiate with and advise patients on critical actions. The patient was given buprenorphine if they exhibited moderate to severe withdrawal symptoms, and was provided with sufficient take-home daily doses of the medication to last them until their scheduled appointment in the hospital's primary care center 72 hours later for MAT. The patients not in withdrawal in the ED were provided buprenorphine for take-home use with a detailed self-medication guide. Office-based buprenorphine MAT was provided for patients over 10 weeks by physicians and nurses using established procedures with visits ranging from once a week to twice a month, depending on clinical stability of the patient.

After the office-based treatment, patients were transferred to either a community program, a clinician, or were offered a two-week detox period, based on their clinical stability, insurance options, and preference. The buprenorphine ED-initiation group was engaged in treatment at higher rates and reported greater reductions in the average number of days of illicit opioid use per week than standard of care control groups.

Critical Success Factors

- **Partnership with community-based treatment services** for follow-up care
- **ED protocol for screening of patients with SUD** who are eligible for buprenorphine intervention
- **Nurses trained to conduct opioid-focused brief negotiation interviews**, and educate patients about buprenorphine
- **Established best practices** for 10-week physician and nurse office-based buprenorphine treatment
- **Collaboration** between ED and community-based addiction treatment providers

Resources

Model I

Darkins, A. "Telehealth Services in the United States Department of Veterans Affairs (VA)." VA Health Care, 2014. PDF.

Darkins A, Ryan P, Kobb R, et al. "Care Coordination/Home Telehealth: The Systematic Implementation of Health Informatics, Home Telehealth, and Disease Management to Support the Care of Veteran Patients with Chronic Conditions." *Lancaster Telemedicine and e-Health.* December 2008, 14(10): 1118 - 1126.

Model II

Mauer B, Jarvis D. "The Business Case for Bidirectional Integrated Care: Mental Health and Substance Use Services in Primary Care Settings and Primary Care Services in Specialty Mental Health and Substance Use Settings." *MCPP Healthcare Consulting.* 30 June 2010. Web.

Thomas M, Waxmonsky J, McGinnis F, Barry C. "Realigning Clinical and Economic Incentives to Support Depression Management Within a Medicaid Population: The Colorado Access Experience." *Administration and Policy in Mental Health and Mental Health Services Research*, 33.1 (2006): 26 – 33. Web.

Model III

D'Onofrio G, O'Connor P, Pantalon M, Chawarski M. "Emergency Department-Initiated Buprenorphine/Nalaxone Treatment for Opioid Dependence: A Randomized Clinical Trial." *JAMA*, *v.313.16* (2015): 1636 – 1644. Web.

For links to these and other resources, please see the Innovation Investments page at mass.gov/hpc

Value-Informed Choices - Purchasers (VIC-Purchasers):

Increase value-informed choices by purchasers (including both employers and consumers) that optimize patient preferences.

A transparent and competitive health care market that rewards high-value providers is essential for constraining growth in health care costs and meeting the health care cost growth benchmark. The majority of care in the Commonwealth is provided by a relatively small number of large, higher priced provider systems and both hospitals and physicians have continued to align with those large systems. Purchasers, defined here as employer groups and consumers, need the ability to make informed choices. Information and insurance product design can support and incentivize these choices.[10]

Strong data, transparency, and quality measurement have important potential to support patients in their health care decisions.[11] However, Massachusetts purchasers have limited visibility into health care service prices and meaningful measures of quality. Price transparency tools are infrequently updated and are deployed variably in Massachusetts, leaving purchasers with little information on the cost and quality of care—including reviews of providers and patient-reported outcome measures. Demand-side incentives, such as limited and tiered network products have existed in the Massachusetts market for a number of years but uptake has slowed and the impact of these products' cost containment is limited. Across the nation, tools that encourage more value-oriented choices are being encouraged by purchasers, including second opinion services when patients face high-cost "shoppable" procedures, reference pricing, and other consumer-oriented incentives to drive patient choice-patterns, as well as price transparency tools, and novel relationships directly between employers and provider organizations.

To address this Challenge, a number of innovations are emerging in the field. The following highlights a selection of innovative models that have successfully demonstrated cost savings. Although ineligible to serve as an Applicant for an Initiative, employer groups are eligible to be Partners. The following example models demonstrate three such ways providers and health plans may work with employer Partners to achieve cost savings. This summary is non-exhaustive, and should be considered an illustrative resource, only.

VIC-Purchasers Model I: Remote Second Opinion and Referral Services (Grand Rounds)

Target Population	Cost Impacts	Secondary Impacts
Candidates for expensive surgery and/or high-cost medical procedures	• $10K average savings/case referred for second opinion • 50% lower LOS	• Decreased mortality rate • Reduction in time to return to work • Patient understanding of condition and options • Increased patient experience • Increased satisfaction of consulting physicians

Service Model

Employers and, increasingly, health plans and delivery systems are contracting with commercial companies offering remote second opinions and referrals for care to optimal experts for members' conditions. Grand Rounds is one such provider company and created a service model to improve the appropriateness and quality of clinical services, patients' understanding of their condition and options, patient experience, and the use of health care resources. Specialist physicians, usually clinicians practicing in large academic medical centers across the country, are retained by Grand Rounds to provide second opinions and referral visits via telemedicine or in-person. Employees of companies such as Costco and Evernote initiate requests for opinions through Grand Rounds' mobile or web interface. Experts logged into the company's interface to review cases and delivered care plans to patients and local treating providers. Experts followed up with patients to ensure they understood the care plans and were able to follow the recommendations with the support of their local providers.

Grand Rounds reported that a typical employer can expect to find approximately 4 percent of employees using the service within 1 year, including remote second opinions and referrals to appropriate local physicians for initial visits. The majority of cases are in orthopedics, neurology, gastroenterology, primary care and oncology. For a health plan, ACO or at-risk health system, Grand Rounds functioned in a similar manner, with the added ability to prioritize the health plan's provider network, or the ACO or health system's own experts, utilizing outside experts only when appropriate physicians are not available in the network.

Across all clients served by Grand Rounds, patients' diagnoses or treatment plans were changed in 66 percent of second opinions, often by cancelling unnecessary surgeries or switching to less invasive procedures or medications. For some

[10] Massachusetts Health Policy Commission. *2014 Cost Trends Report.* Boston: 2015. Web.

[11] Morse, Susan. "Experts put the patient at the center of value-based care." *Healthcare Finance*, 2 February 2016. Web.

clinical conditions, optimal care for an average case resulted in increased expenditures. Of the total cost savings achieved across a referred case, ninety percent is achieved in the first 30 days of employees utilizing the tool for second opinions.

Critical Success Factors

- **Online platforms** to facilitate patient requests and support interactions with expert physicians
- **Empirical data and clinical matching** used to refer patients to expert physicians in their region and insurance network
- **Continuous analysis of patient experience**, clinical recommendations, and results for refinement of expert panels
- **Collection and digitization of medical records**, and preparation of summaries for expert review
- **Preparation of patient** to facilitate productive interaction with assigned expert
- **Physician-led team of nurses and counselors** to provide support and clinical guidance to patients throughout episode of care

VIC-Purchasers Model II: Price Transparency and Reference Pricing (CalPERS, Wellpoint)

Target Population	Cost Impacts	Secondary Impacts
Patients/members requiring care for "shoppable" conditions, such as hip and knee replacements	**Reference Pricing:** • 30% reduction in cost of surgery to payer • ~$7K in savings per patient • 10% reduction in readmissions **Price Transparency:** • 19% reduction in cost per test	• Improved patient experience at facilities designated by the reference pricing system • Reduced prices for joint replacements • Reduced price variation • Increased competition among providers leading to price reductions

Service Model

Reference pricing is a strategy used by health plans to establish a standard price for a medication, procedure or service, and requires members to pay any charges beyond that price. CalPERS, the California agency responsible for managing pension and health benefits for 1.6 million California public employees, retirees and families, in partnership with its PPO third-party administrator, Anthem, researched the average cost for hip and knee replacements at California hospitals and found a five-fold variation in prices, with no measurable difference in quality. In response, the agency identified and designated forty-one hospitals as preferred providers based on the following criteria: procedure prices were less than $30,000, quality was acceptable, and collectively the hospitals provided sufficient geographic dispersion. Then, in order to encourage use of these providers, CalPERS set the maximum reimbursement amount for hip and knee replacements at any hospital at $30,000 (the reference price).

Patients received intensive educational outreach from CalPERS on these options for care and reported satisfaction with the quality of care received at designated facilities. Researchers compared 30-day general complication and infection rates and 90-day follow-up admission rates for CalPERS patients before and during the program, and found no significant difference in quality outcomes. Program leaders noted that reference pricing, alone, does not identify cases in which the procedure is inappropriate or unnecessary. They further cautioned that reference prices should be designed to accommodate the higher costs of complex procedures and physicians services and follow-up care or otherwise exclude those types of costs entirely.

In another program designed to drive consumer choice through price differentials, Wellpoint developed its price transparency program in collaboration with Blue Cross Blue Shield health plans in select regions across the United States. Patients identified as targets for the program were informed of price differences among local MRI facilities and given the option of selecting an MRI provider. Simply by publicizing price information, Wellpoint observed a $220 cost reduction (18.7 percent) per test and a decrease in use of hospital-based facilities from 53 percent in 2010 to 45 percent in 2012. Wellpoint has since scaled its MRI program to more regions of the country and is considering extending the program to additional procedures that require prior authorization or notification, such as echocardiography and other high-tech imaging (i.e. PET scans or nuclear cardiology), sleep studies, preventive colonoscopy, arthroscopy, and elective joint replacement surgeries.

Critical Success Factors

- **Claims analysis** to determine patients' health care utilization patterns and provider payment caps, in the case of CalPERS
- **Easy member access to information**
- **Extensive educational outreach** by employer and/or health plan to arm patients with decision-making skills
- **Opportunities for additional providers and facilities to be added** to published lists as competition brought prices down

VIC-Purchasers Model III: Employer-Driven Care Delivery and Benefit Innovations (Boeing, Dartmouth College, Expedia)

Target Population	Cost Impacts	Secondary Impacts
Employees (patients) with severe chronic illness	• 20% reduction in total health care spending (employer spending and patient cost sharing) • 3-6% net spending reduction (population-wide)	• Improved functional status • Reduced work-days missed • Improved patient access

Service Model

In 2009, the Boeing Corporation completed a successful pilot of an Intensive Outpatient Care Program (IOCP) that substantially reduced total health care spending for the highest-cost quintile of employees in the Puget Sound region of Washington. In partnership with Mercer Health and Benefits, the California HealthCare Foundation, Renaissance Health, Regence BlueShield of Washington, and three physician groups (IPAs), Boeing incentivized providers via a monthly per-patient intensive management fee to launch an ambulatory intensive care unit (a-ICU) for its employees with severe chronic illness.

High-risk patients from Boeing's non-Medicare, non-HMO self-funded plans were invited to enroll in the IOCP. A comprehensive care team (a now fairly conventional model of high risk case management, including RN case management, social work, and a PCP) wrapped high-risk patients in intensive in-person, telephonic, and remote services (initially email, subsequently telemedicine). After 12 months of enrollment and services, patients were studied in a propensity-matched evaluation which demonstrated a 20 percent reduction in total (employer and patient cost sharing) spending, a 15 percent increase in functional status, and a 57 percent reduction in average work-days missed. Additional savings not reflected in these figures accrue from avoidance of unnecessary procedures upon exposure to a second opinion. Although the clinical model of a-ICU has gained traction, the innovation of a self-insured, purchaser-led intervention remains somewhat novel. Notably, Boeing did not utilize patient-directed incentives to drive volume into the a-ICU.[12] Boeing has subsequently entered into direct contracting relationships with a number of providers, seeking to drive further efficiency.[13]

Across the nation, employers are shaking up the market with tools such as high-performance networks, direct contracting, centers of excellence and reference pricing. Direct contracting, in particular, has taken hold as a model with strong potential for cost-savings, where highly effective businesses take a strong role in managing provider networks. Examples of this model include Iora Health (for Dartmouth and the Freelancers Union) and Qliance (for Expedia and United Food & Commercial Workers).[14]

Critical Success Factors

- **Enlisting provider champions** to help educate, advocate, and develop and test changes
- **Employee-oriented incentives** to stimulate participation in models
- **Comprehensive outreach and education programs** to support physicians, patients, health plans, and employers in facilitating meaningful discussions and taking action
- **Sufficient employee base** to achieve meaningful population size, or partnership between multiple purchasers.

Resources

Model I

Grand Rounds. "CFO Data Sheet: Improve Health Care Options for Your Employees and Reduce Wasted Spend with Grand Rounds." 2015. PDF.
Grand Rounds. "Background on Grand Rounds." PDF.

Health Management. *"Growth in Online Second Opinion Services."* 2015. Web

Model II

Lechner A, Gourevitch R, Ginsburg P. "The Potential of Reference Pricing to Generate Health Care Savings: Lessons from a California Pioneer." *Center for Studying Health System Change v. 30* (2013): 1-9. Web.

Robinson J, Brown T. "Increases in Consumer Cost Sharing Redirect Patient Volumes and Reduce Hospital Prices for Orthopedic Surgery." *Health Affairs v.32.8* (2013): 1392 – 1397. Web.

[12] Milstein A, Kothari P. "Are Higher-Value Care Models Replicable?" *Health Affairs*, 20 October 2009. Web.
[13] Cliff E, Spangler K, Delbanco S, Perelman N, Fendrick A. "Aligning quality, price transparency, clinical appropriateness and consumer incentives." *Catalyst for Payment Reform*, September 2013. PDF.
[14] Chase D. "On Retainer: Direct Primary Care Practices Bypass Insurance." *California Healthcare Foundation*, April 2013. PDF.

Li C, Wu S, Belman M, DeVries A. "Effects of a Reference-Based Purchasing Design on Healthcare Utilization and Outcomes of Knee and Hip Replacement Surgeries." HealthCore Wellpoint. PDF.

Wu S, Sylwestrzak G, Shah C, DeVries A. "Price Transparency for MRIs Increased Use of Less Costly Providers And Triggered Provider Competition." *Health Affairs, v.33.8* (2014): 1391-1398. Web.

Wu S, Shah C. "Breaking Through the Barriers of Moral Hazard: Results from a Health Plan Sponsored Price Transparency Initiative." Wellpoint, Inc. Academy Health, June 2014. PDF.

Model III

Milstein A, Kothari P. "Are Higher-Value Care Models Replicable?" Health Affairs, 20 October 2009. Web.

Cliff E, Spangler K, Delbanco S, Perelman N, Fendrick A. "Aligning quality, price transparency, clinical appropriateness and consumer incentives." Catalyst for Payment Reform, September 2013. PDF.

Chase D. "On Retainer: Direct Primary Care Practices Bypass Insurance." California Healthcare Foundation, April 2013. PDF.

For links to these and other resources, please see the Innovation Investments page at mass.gov/hpc

Value-Informed Choices - Providers (VIC-Providers):

Increase value-informed choices by providers that address high-cost tests, drugs, devices, and referrals.

The Health Policy Commission has estimated that 21 to 39 percent of health care spending in Massachusetts ($14.7 to $26.9 billion based on 2012 spending) can be considered wasteful, or spending that could be eliminated without reducing the quality of care patients receive.[15] Provider adoption of value-informed models of care offers the opportunity to improve care outcomes and patient experience, while reducing resource use.

Providers often lack adequate tools and awareness of best practices to improve quality and efficiency, leading to significant variation in cost and quality of health care for patients. Advances in payment reform, care coordination models, and real-time information exchanges have been inconsistently adopted across the state. Studies have documented substantial variation in delivery of low-value care nationally and in Massachusetts, specifically. Some low-value treatments confer risk of harm, indirectly cause downstream harm, or result in significant spending.[16]

As detailed in the HPC's 2015 Cost Trends Report, there are a large number of providers performing non-emergent services which vary widely in price, but not in quality. Routine procedures such as colonoscopies, common lab tests, and high cost drugs with generic alternatives vary greatly in price, which creates an opportunity for cutting waste without impacting quality. Almost two-thirds of common lab tests in Massachusetts are performed in hospital outpatient departments, which tend to be the most expensive setting of care.[17] Care coordination must be informed by appropriate cost and quality metrics—either as part of an integrated medical home model, or to target narrow episodes of care. These methods avoid wasteful or unnecessary medical tests, treatments, and procedures, especially for complex populations. Consequently, financial incentives, provider commitment to change, effective patient engagement, and community collaboration are critical ways of informing care to address system waste.

To address this Challenge, a number of innovations are emerging in the field. The following highlights a selection of innovative models that have successfully demonstrated cost savings. This summary is non-exhaustive, and should be considered an illustrative resource, only.

VIC-Providers Model I: E-Consult/E-Referral (Los Angeles County Dept. of Health)

Target Population	Cost Impacts	Secondary Impacts
Patients referred by PCPs for non-urgent specialty care	~ 30%-60% reduction in specialist visits (varies by specialty) • 30-40% reductions for obstetrics, gastroenterology, urology, and nephrology; • 40-50% for dermatology and echocardiogram; and • 50-60% for adult endocrinology, cardiology, diabetes, adult neurology.	• Reduced cost per specialist consultation • Reduced wait times for specialty visits by weeks or months • Improved PCP and specialist satisfaction

Service Model

The L.A. County Department of Health Services implemented this program to help patients bypass long waits for referral services, ease the burden on EDs, and streamline the referral process by allowing PCPs to consult with specialists via web to exchange medical records and/or photos. Referring PCPs used specialty- and condition-specific templates to provide background on referrals. Specialty reviewers either responded with advice for PCPs or determined whether the patient required an in-person specialist visit. The E-Consult system facilitated more than 10,000 requests for 40 specialties in a single month.

The E-Consult system strengthened PCP knowledge about the appropriate management of a wider variety of cases, reducing the need for in-person visits with specialists. It improved communication, collaboration, and trust among PCPs and specialists. Most of the work of preparing requests was done by medical assistants in the PCP offices, requiring the PCP to complete only the clinical work-up and relevant background sections.

[15] Massachusetts Health Policy Commission. *2014 Cost Trends Report.* Boston: 2013. Web. Page 34.

[16] Colla, Carrie, Moden, Nancy, et al. "Choosing Wisely: Prevalence and Correlates of Low-Value Health Care Services in the United States." *Journal of General Internal Medicine v.30* (2014):221-228. Web.

[17] Massachusetts Health Policy Commission. *2015 Cost Trends Report.* Boston: 2016. Web. Page 44.

In health systems adopting E-Consult/E-Referral, representatives from each specialty met to prepare the templates for referrals and guidelines to prioritize in-person visits. This typically took two months, since pre-existing templates and guidelines were available from other systems operating such programs. Regular meetings between the specialty advisors and PCP representatives ensured that communication and handoffs would be effective.

A similar E-Consult/E-Referral system has been established within the Mayo Clinic to build capacity for specialty E-Consults with affiliated institutions around the country. It took four months to get the program running, after which time it reported an 85 percent reduction in the need for in-system, in-person visits. Further, it found that E-Consults required one-third of the time for an in-person visit. At Mayo Clinic, more than 170 specialty- and condition-specific templates have been developed by 40 specialties and sub-specialties.

Critical Success Factors

- **PCPs must submit all referrals through the E-Consult system**
- **Software to integrate with the EHR** or use independently to deliver a common platform for provider referral & consultation
- **Redesign of clinical workflow** to integrate E-Consult into daily operations of PCP offices and clinics
- **Emphasis on medical assistant role** to reduce PCP workload
- **Standardization** of referral guidelines
- **Culture of collaboration** between PCPs and specialists

VIC-Providers Model II: Surgical Bundled Payments (Cleveland Clinic)

Target Population(s)	Cost Impacts	Secondary Impacts
• Patients requiring at least one MRI scan • Patients requiring specific elective surgical procedures	• 15% reduction in use of hospital-based facilities	• Reduction in price variation between designated hospital and non-hospital facilities (up to 30%) • Reduced hospital LOS • 67% reduced in-hospital mortality • 10% reduced complications rate

Service Model

Cleveland Clinic has contracted directly with employers such as Lowes and Walmart since 2010 to provide surgical care at a fixed, bundled rate for services related to certain elective surgical procedures. "Bundled payment" is an alternative payment method (APM) that makes a single payment for all services to treat a given condition or provide a given treatment with prescribed time bounds, such as a single payment for an episode of care—so that providers are accountable for efficiently providing high-quality care. Employer groups benefit from discounted, predictable cost outlays for expensive procedures, and offer demand-side incentives to employees by waiving deductibles and out-of-pocket costs for receiving bundled care from select providers.

Cleveland Clinic's medical operations and finance teams work with physicians to identify and standardize utilization of high-value technologies and less-pricey medical supplies, both within bundled payments and other types of payment models. The predictable volume of procedures allows Cleveland Clinic to invest in rigorous data tracking and process standardization leading to better outcomes, fewer complications, and supply-chain optimization that drives a reduction in the overall cost of care. Gain sharing, where physicians may be paid a percentage of savings if they keep costs under a benchmark, and detailed cost information for each procedure, is used to make the doctors more conscious and directly involved in managing the service line and the cost and outcomes associated with procedures. Cleveland Clinic has since expanded their eligible surgical sites nationally to other employers. Bundled payment models create incentives that encourage high-value choices by both providers and consumers that could improve health outcomes while reducing cost.

Critical Success Factors

- **Distribution of procedure-specific information** to members, including geographically convenient facilities and quality information based on provider-reported capability data
- **Full, up-to-date understanding of costs**, including baseline, labor, physician, device, suppliers, and program costs in order to right-size pricing
- **Gain-sharing incentives** that spread the benefits and risks of care accountability to specialists
- **Decision-support tools for members** integrating information on cost, quality, and provider location

VIC-Providers Model III: Shared Decision-Making (Choosing Wisely)

Target Population	Cost Impacts	Secondary Impacts
Patients directed to undergo selected tests or procedures	• 4.5% reduction in TME for ACO patients • 20% fewer labs ordered in 1 year	• Improved quality of care • Reduced patient out-of-pocket expenses • Improved patient understanding of condition and options

Service Model

In 2012, the American Board of Internal Medicine (ABIM) Foundation launched Choosing Wisely to spur a national dialogue on avoiding wasteful or unnecessary medical tests, treatments, and procedures. The project supports conversations between providers and patients informed by evidence-based recommendations contained in "Things Providers and Patients Should Question," a list of over-used tests and procedures.[18] More than 70 specialty society partners have released such recommendations, and Consumer Reports works with the specialty societies to create patient-friendly materials.

Twenty-one regional initiatives have been led by state medical societies, specialty societies, and regional health collaboratives to help educate physicians about these recommendations and build skills to have conversations with patients about the care they need. To facilitate patient engagement in care choices, Choosing Wisely provided physicians with conversation aids and examples designed by Consumer Reports to be accessible and patient-friendly, and provided step-by-step guides for physicians on how to engage in meaningful value-based conversations about care with patients.

In 2014, the ABIM Foundation engaged the Institute for Clinical and Economic Review (ICER) to provide brief analyses of the potential impact of recommendations regarding 6 procedures, including the potential for savings. When coupled with the practice pattern variation approach (as described in the practice pattern variation Challenge) to deploying Choosing Wisely recommendations, ICER estimated that national savings within the Medicare population alone could total $798 million.

Critical Success Factors

- **Utilization of already-identified low-value and inappropriate tests and treatments**
- **Enlisting physician champions** to help educate, advocate, and develop and test changes
- **Comprehensive outreach and education programs** developed by Choosing Wisely and Consumer Reports to support physicians, patients, health plans, and employers in facilitating meaningful discussions and taking action
- **Consultation with specialty societies** for local implementation and integration approaches

Resources

Model I

Global Lab for Innovation. "Innovation Profile: eConsults." UCLA Health, 2014. PDF.

Chen A, Kushel M, Grumbak K, Yee Jr. H. "A Safety-Net System Gains Efficiencies Through 'eReferrals' To Specialists." *Health Affairs, v.29.5.* (2010): 969-971.

Chen A. "Improving the Primary-Specialty Care Interface." University of California San Francisco. PDF.

Model II

Massachusetts Health Policy Commission. 2015 Cost Trends Report. Boston: 2016. Web. Page 57.

McGarry N. "Bundled services: Transitioning from cost savings to market share gains." *The Advisory Board Company*, February 25, 2015. Web.

Model III

Colla C, Moden N, et al. "Choosing Wisely: Prevalence and Correlates of Low-Value Health Care Services in the United States." *Journal of General Internal Medicine v.30* (2014):221-228. Web.

Choosing Wisely. "Advancing the *Choosing* Wisely Campaign in Clinical Practices and Communities." *ABIM Foundation & Robert Wood Johnson Foundation*, 2015. PDF.

Wolfson, D. "Taking Stock of *Choosing Wisely*." *Health Affairs Blog*, December 3, 2015. Web.

Washington Health Alliance. "Choosing Wisely in Washington State: A Report." September 2014. PDF.

For links to these and other resources, please see the Innovation Investments page at mass.gov/hpc

[18] The ABIM Foundation's Choosing Wisely Patient and Provider resources: http://www.choosingwisely.org/doctor-patient-lists/

Practice Pattern Variation (PV):

Reduce practice pattern and cost variability in hip/knee replacements, deliveries, and other high-variability episodes of care.

The delivery system continues to rely on incentives that drive overuse of health care services: payment is rendered for services performed, not on the outcome of those services, and patients are often shielded from costs. Further, there is an almost industry-wide lack of knowledge of how much it costs to deliver patient care on the individual level.[19] These conditions have led to provider practice pattern variation, or the differences in the processes of providing care for a particular clinical problem among different providers. Practice pattern variation is seen across a variety of service lines and provider settings even after controlling for demographic and sociocultural circumstances and health status.[20] In addition to factors already cited, this variability is further influenced by the demand for care and characteristics of the delivery system (e.g., available provider mix).

Provider practice pattern variation is a challenge observed within and across provider organizations, as well as across regions. As differences in practice patterns drive variation in costs and spending, practice pattern variation contributes to wasteful spending in the form of unwarranted care.[21] Limited evidence exists of specific decision support models and other approaches to address practice pattern variation; rather, evidence suggests that addressing such variation must be driven by local improvement efforts.

Given the limited number of published innovations specifically addressing practice pattern variation, Applicants should approach this Challenge by identifying the presence of variation in their own organization(s) through internal analyses, highlight the opportunity for savings that exists, and demonstrate evidence of relevant improvement efforts (especially innovative analytic approaches, decision support tools, and other practice change approaches), that coupled with the presence of variation, could achieve savings. The models described below are intended to be illustrative approaches to improvement and are a non-exhaustive summary.

PV Model I: Time-Driven Activity-Based Costing (Mayo Clinic)

Target Population	Cost Impacts	Secondary Impacts
Providers participating in high-variability episodes of care • Hip replacements • Knee replacements	• 15% decrease in costs • 24% decrease in patients discharged to SNFs	• Reduced LOS • Reduced patient pain score • Increased potential to identify other cost saving solutions with utilization of process maps

Service Model

The Mayo Clinic began using Time-Driven Activity-Based Costing (TDABC) to pursue a value-based system of care, and focused on streamlining the process of total knee and hip replacements at all three of their facilities. The goals of the project were to determine outcome metrics, use TDABC to identify all expenses associated with these procedures (from pre-surgical visits through post-discharge follow-ups), and improve the value of care.

Mayo created a project team across the three sites, with a project leader to coordinate work and a financial analyst to provide the relevant data at each location, and a systems engineering analyst to conduct the process mapping for all locations, to ensure consistency and detail in data such as length of stay, complication rates, 30-day readmission rates, patient pain scores, and physician techniques and practices. The project team received the support of a senior clinician for each medical condition, and interviewed a number of physicians at each site to capture all treatment protocols in the process maps, test ideas for potential improvements, and implement the recommended changes.

The TDABC process maps created at each site showed that the different locations had significant variation in procedure, which offered a source for improvement. Mayo found that the Arizona and Florida locations had different practices for controlling patients' pain, which resulted in patients reporting the same level of pain following surgery, but different LOS between surgery and physical therapy. The Florida location adjusted their pain-control regimen, and therefore reduced their LOS rate, and the rate of discharge to SNFs. The Florida location also changed their communication standard between physicians and patients prior to operations, to better set expectations for the LOS and assist with discharge planning. The use of process mapping had unanticipated benefits at the Florida facility, and allowed Mayo to begin pursuing other opportunities for improvement.

[19] Kaplan, R, Porter, M. *How to Solve the Health Care Cost Crisis.* Harvard Business Review, 2011.

[20] Brook, R, Lohr, K. *Efficacy, Effectiveness, Variations, and Quality: Boundary-crossing Research.*

[21] The Dartmouth Atlas of Health Care. *"Reflections on Variations: Time to Tackle Unwarranted Variation in Practice,"* 2011.

Other approaches to TDABC include Cleveland Clinic's pilot program, which sought to improve accuracy of cost information, and find opportunities for cost-reduction and value-improvements. The pilot studied clinical practices for heart-valve procedures, and found there was room for significant change and enhancement in direct administrative and support processes following surgery. These processes represented approximately 6 percent of the expense of that episode of care, and streamlining these procedures, furthermore, offered Cleveland Clinic a reduction in cost.

Critical Success Factors

- **Strong executive support**, e.g. designated executive steering committee for each value-improvement project
- **Multi-disciplinary project team** to map processes and measure outcomes, e.g. finance, systems engineering
- **Physician engagement in each medical specialty** to ensure that process maps are credible and actionable
- **Measurement and tracking** for both costs and outcomes

PV Model II: Reduction of Inappropriate Practice Pattern Variation (Choosing Wisely)

Target Population	Cost Impacts	Secondary Impacts
Providers delivering procedures identified as low value	• 4.5% reduction in TME for ACO patients • 25% fewer labs ordered in 1 year	• Improved quality of care • Reduced patient out-of-pocket expenses • Improved patient understanding of condition and options

Service Model

In 2012, the American Board of Internal Medicine (ABIM) Foundation launched Choosing Wisely to spur a national dialogue on avoiding wasteful or unnecessary medical tests, treatments, and procedures. The project supported conversations between providers and patients informed by evidence-based recommendations contained in "Things Providers and Patients Should Question," a list of over-used tests and procedures.[22] More than 70 specialty society partners have released such recommendations, and Consumer Reports worked with the specialty societies to create patient-friendly materials.

Health systems have leveraged Choosing Wisely to achieve cost savings by identifying specific inappropriate and low-value tests overrepresented at their organizations and establishing special task forces, developing new protocols and targeting education and publicity campaigns aimed at highly variable, low-value tests and procedures, and the providers identified with particularly high rates of ordering them. These initiatives were sometimes implemented in partnership with Carriers, who provided analytic, protocol development, or payment incentives for the initiative.

In 2014, the ABIM Foundation engaged the Institute for Clinical and Economic Review (ICER) to provide brief analyses of the potential impact of recommendations regarding 6 procedures, including the potential for savings. When coupled with the shared decision-making approach (as described in the Value-Informed Choices - Provider Challenge) to deploying Choosing Wisely recommendations, ICER estimated that national savings within the Medicare population alone could total $798 million.

Critical Success Factors

- **Utilization of already-identified low-value and inappropriate tests and treatments**
- **Comprehensive outreach and education programs** developed by Choosing Wisely and Consumer Reports to support physicians, patients, health plans, and employers in facilitating meaningful discussions and taking action
- **Enlisting Physician Champions** to help educate, advocate, and develop and test changes
- **Consultation with specialty societies** for local implementation and integration approaches

Resources

Model I

Haas D, Helmers R, Rucci M, Brady M, and Kaplan R. "The Mayo Clinic Model for Running a Value-Improvement Program." The Harvard Business Review. 22 October 2015. Web.

Model II

Choosing Wisely. "Advancing the *Choosing* Wisely Campaign in Clinical Practices and Communities." *ABIM Foundation & Robert Wood Johnson Foundation*, 2015. PDF.

Colla C, Moden N, et al. "Choosing Wisely: Prevalence and Correlates of Low-Value Health Care Services in the United States." *Journal of General Internal Medicine v.30* (2014):221-228. Web.

Washington Health Alliance. *"Spotlight on Improvement: Swedish Medical Center – Rethinking the practice of ordering daily labs to reduce waste and improve care."* November 2014. Web.

Wolfson, D. "Taking Stock of *Choosing Wisely*." *Health Affairs Blog*, December 3, 2015. Web.

[22] The ABIM Foundation's Choosing Wisely Patient and Provider resources: http://www.choosingwisely.org/doctor-patient-lists/

Post-Acute Care (PAC):

Improve hospital discharge planning to reduce over-utilization of high-intensity post-acute care (PAC) settings as well as improve efficiency and transitions of care within and between PAC providers.

When a patient is discharged from the hospital, there are a number of care planning decisions that must be made. Among these decisions is determining whether and in what setting the patient requires post-acute care. For certain patients, discharge to institutional PAC services (SNFs, IRFs, and LTACHs) might be the right option for their needs, but many patients could be safely discharged to home or to lower-cost settings without affecting quality of care. Higher rates of PAC use result in higher costs, which could be justified if patients had lower readmissions or improved quality outcomes; however, higher rates of PAC utilization do not appear to result in cost savings or enhanced quality. In addition to clinical factors, a variety of non-clinical factors influence discharge decisions, including the availability of PAC facilities or open beds, the hospital's or family's proximity to PAC providers, patient or family preference, and the presence of a spouse or other caregiver at home. Evidence-based planning tools rationalize this process and enable systematic consideration of key factors.

The HPC has found that PAC utilization rates in Massachusetts are higher than national trends across all payer types. In 2012, the number of patients in Massachusetts who had some form of PAC after an inpatient discharge was 11 percent higher than patients nationwide.[23] Given the relatively high cost of institutional PAC services, and the goal of ensuring that patients are in the least restrictive setting necessary, payers and providers have opportunities to deploy evidence-based tools to improve discharge planning, target use of institutional settings to only the most appropriate patients, and increasingly improve the transitions of care and support for patients discharged to home. Moreover, the ability to manage and coordinate PAC services may be crucial for providers to succeed under APMs and to reduce rates of avoidable readmissions.[24]

To address this Challenge, a number of innovations are emerging in the field. The following highlights a selection of innovative models that have successfully demonstrated cost savings. This summary is non-exhaustive, and should be considered an illustrative resource, only.

PAC Model I: Care Coordination & Decision Support (UPenn Health System, Houston Methodist Hospital)

Target Population	Cost Impacts	Secondary Impacts
Patients discharged from hospital to SNF, home health, social services, or self-care at home	• 15% decrease in discharges to SNF • 35% decrease in readmissions • 0.6 day decrease in hospital LOS • 15% decrease in SNF LOS	• Increased referral lead time for pre-discharge planning (~30 hours) • Decreased ED utilization • Increased patient and family access to support services

Service Model

Health systems and hospitals have implemented care coordination and decision support commercial solutions such as RightCare, NaviHealth, and others, to build strong and increasingly effective discharge teams that emphasize patient guidance during discharge planning, improvement of care team linkage across settings, and proactive support of patients' ongoing care needs. The ongoing ability to track performance helps health systems to drive clinical standardization and to create partnership-wide physician alignment, in collaboration with community-based partners such as clinics, PAC facilities, and other LTSSs.

Developed at the University of Pennsylvania Health System and deployed by hospitals such as Thomas Jefferson University Hospital and Houston Methodist Hospital, RightCare maintains a software platform to enable discharge planners and care managers to select optimal post-acute care, and navigate the placement of patients in optimal levels of care and facility. Predictive analytics and patient-disposition matching algorithms help ensure the most appropriate care plan in order to avoid hospital readmissions and unnecessary LOS in PAC facilities. Upon admission to the hospital, discharge planners began evaluating patients on clinical needs and the wishes of the care teams, patients, and family using analytics and benchmarks. A comprehensive post-acute care plan was developed by discharge planners, using a self-service dashboard portal. The supporting analytics provided information to the planners on the patient's risk of readmission, need for post-acute care, optimal placement based on likelihood of positive outcomes in different PAC settings, optimal SNF LOS, intensity of therapy (days, hours/day), expected functional improvement over time, and burden of care following discharge from PAC.

Discharge planners reviewed this information with the patient and patient's caregivers, and followed up with the

[23] Massachusetts Health Policy Commission. *2015 Cost Trends Report.* Boston: 2016. Web.

[24] Massachusetts Health Policy Commission. *2014 Cost Trends Report.* Boston: 2015. Web. Page 33.

patient after discharge using the software to identify factors that would support improvements in cost and quality, in ongoing tracking of results against utilization and price targets, and of adherence to care plans post-discharge. This allowed discharge planners and managers of transitions of care to continuously improve the placement and post-discharge management of patients. Hospital administrators could track against at-risk reimbursement and a variety of gain- and risk-sharing arrangements with physicians and post-acute care providers. With continuous improvement efforts and monitoring of performance, discharge planning departments typically achieve their expected targets for utilization and financial impact within six months.

Critical Success Factors

- **Care planning starting at admission**; discharge expectations set with patients and families on the first day of hospital stay
- **Patient-need determination software** that matches optimal level of PAC to each patient
- **Narrow networks of high-quality PAC partner facilities and services**
- **Active management of PAC performance** by the contracting agency or facility
- **Remote low-cost monitoring** and tracking of recovery at home

PAC Model II: Home-Based Remote Management (CHRISTUS Health System, Intermountain Health System)

Target Populations	Cost Impacts	Secondary Impacts
• Patients discharged to home • Patients with chronic conditions	• 90% reduction in TME • 65% reduction in hospital readmissions • 24% reduction in hospital admissions • 27% reduction in hospital days	• Increased patient satisfaction rate • Increased patient adoption and adherence • Increased provider acceptance and satisfaction • Replacement of clinic visits with virtual visits (50%; ex. Children's hospital) • Average of 3.6 fewer RN home health visits per episode

Service Model

Increasingly, health systems are supporting lower-cost home-based care using remote care management platforms to monitor the health of patients, support self-care, and improve assistance from caregivers. These types of platforms enable planners and care managers to have frequent contact with patients in their homes, answer patients' questions as they arise, and provide extensive resources for patient and family/caregiver education. Health Systems such as the CHRISTUS Health System and Intermountain Health System have partnered with one such commercial example, Vivify Health, to deploy consumer electronics, wireless health devices, and the cloud-based data storage to enable the "last mile" of population health management. The consumer electronics were supplied by a partnership with AT&T, which provided a cellular connected tablet, paired via Bluetooth to personal health devices such as weight scales, blood pressure monitors, or pulse oximeters. The equipment and devices were HIPAA-certified and FDA-approved; discharge planners gave them to patients as they left the hospital, or, for chronic disease patients who required monitoring to prevent admissions, the equipment was shipped to the patient's home. The simplicity of the patient and provider experience led to high adoption and satisfaction scores, and almost all patients were able to use the system without in-home tech support. Planners and clinicians assigned educational video content and used video-conferencing for virtual visits. 24/7 tech support was provided, with an optional clinical command center to manage patient monitoring and communications.

Customers included academic centers and multi-state integrated delivery systems, several of which have conducted studies of clinical and financial impact. Initial investment was modest, and savings typically yielded a ROI of 1:2.5 within 5 - 6 months. In some cases, payers reimbursed for use of the remote management system. A recent AHRQ review of telehealth for monitoring and management of chronic disease also concluded that the majority of studies have been positive.

Critical Success Factors

- **Consumer telecommunications devices** (tablet, TV) paired with Bluetooth-enabled biometric monitoring devices
- **Tiered technology platform** that aligns appropriate technology to risk profile
- **Single-touch, instant-on care plan activation** with patients at discharge
- **Take home kit design** (form factor) for appeal to patient and provider alike
- **Locked down (remote communication and education use only) tablet** to eliminate patient guesswork and confusion.
- **Manage-by-exception** monitoring methodology to drive provider efficiency
- **Text-to-speech** to address visual impairment and literacy barriers, and promote heightened patient engagement

• **Educational video content,** virtual visits, and care plan surveys to shape behavior

PAC Model III: Nursing Home After-Hours Telemedicine Service (Harvard Medical School)

Target Populations	Cost Impacts	Secondary Impacts
• Patients at a nursing home facility • Patients with high hospitalization rate	• 9.7% reduction in hospitalization • $120k net savings per nursing home per year	• Increased satisfaction of SNF workforce

Service Model

A chain of 11 for-profit nursing homes implemented a nursing home after-hours telemedicine service pilot, which was evaluated by Harvard Medical School researchers through a randomized, controlled trial. The study, conducted in collaboration with a commercial telemedicine provider, was implemented at randomly assigned nursing home facilities, which introduced telemedicine to assess the effect of the intervention on hospital transfers.

When a nursing home resident had an off-hour medical problem, a staff member brought the cart into the resident's room, and contacted the telemedicine service. The incoming calls were triaged by the medical secretary to the appropriate provider at the call center. In addition to the medical secretary, the service's medical call center was supported by three providers: a registered nurse, a nurse practitioner, and a physician. Because off-hours phone consultation by providers does not generate reimbursement, 90 percent of the physicians were willing to hand off their coverage to the telemedicine service. The service coverage included calls on weekdays (5-11pm) and weekends (10 am-7 pm).

The study found that nursing homes that engaged in off-hours telemedicine coverage generated cost savings for Medicare that far surpassed the nursing home's investment in the service.

Critical Success Factors

- **Designate a staff champion** to encourage telemedicine use
- **Telemedicine facility staffed by appropriate specialists,** such as emergency physicians
- **Clinical protocols adapted to incorporate telemedicine-**based services, with supportive ongoing education

Resources

Model I

Ali S, Getz MJ, Chung H. "Bridging the gap for patients with mental illness." *Mental Health Clinician, v.5.1* (2015):40-5.

Houston Methodist. "Houston Methodist Hospital: A DSRIP Case Study Success Story." Southeast Texas Regional Healthcare Partnership. Texas Healthcare Transformation and Quality Improvement Program – Medicaid. 2015. PDF.

Bowles K. "Implementing Decision Support Tools to Enhance Care for Older Adults." University of Pennsylvania School of Nursing. PDF.

Scully T. "Innovations in Managing Post-Acute Care." NaviHealth. Brandeis Health Forum. PDF.

Model II

Baker L, Johnson S, Macaulay D, Birnbaum H. "Integrated Telehealth And Care Management Program For Medicare Beneficiaries With Chronic Disease Linked To Savings." *Health Affairs, v.30.9* (2011): 1689-1697. Web.

Webster L, Clifton S, Ford E. "Case Study: Remote Patient Monitoring for Care Transition Intervention Program, utilizing Remote Patient Monitoring System (RPMS) from Vivify Health." Christus Health. PDF.

Vivify Health. "Company & Solution Overview." February 2016. PDF.

Model III

Pedulli L. "Telemedicine reduced hospitalizations of nursing home patients." *Clinical Innovation and Technology*. 4 March 2014. Web.

Grabowski D, O'Malley A. "Use of Telemedicine Can Reduce Hospitalizations of Nursing Home Residents and Generate Savings for Medicare." *Health Affairs, v.33.2* (2014): 244 – 250. PDF.

Grabowski D, O'Malley A. "Telemedicine and Nursing Home Hospitalizations." *The Commonwealth Fund; Harvard Medical School.* PDF.

For links to these and other resources, please see the Innovation Investments page at mass.gov/hpc

Serious Advancing Illness (SAI) & Care at the End of Life (EOL):

Support patients in receiving care that is consistent with their goals at the end of life and provide comprehensive community- and home-based services

Patients with serious advancing illness and those at the end of life disproportionately use high cost, inpatient health care services. More than 50 percent of health care spending goes to the sickest 5 percent of patients, and over half of that amount is spent in the last year of life.[25] As important, while two-thirds of Massachusetts residents express a desire to die at home, more than three out of four die in hospitals or nursing homes.[26]

One driver of both cost and quality challenges is excessive medical interventions to extend patients' lives contrary to their wishes. Traditional medical approaches to serious advancing illness tend to result in fragmented care at the end of life, leading not only to lower patient and family quality of life, but also increased costs from mismanagement of painful symptoms that increase length of stay or cause ED visits and inpatient admissions.[27] Advance care planning (ACP) helps patients effectively identify and prioritize their wishes, and palliative care helps to alleviate suffering and improve quality of life, whereas hospice helps patients and caregivers meet their needs at the patient's end of life. ACP, palliative care and hospice are emerging strategies targeting this Challenge.

To address this Challenge, a number of innovations are emerging in the field. The following highlights a selection of innovative models that have successfully demonstrated cost savings. This summary is non-exhaustive, and should be considered an illustrative resource, only.

SAI & EOL Model I: In-Home Palliative Care (Kaiser Permanente)

Target Populations	Cost Impacts	Secondary Impacts
• Patients at end of life • Patients with advanced COPD, heart failure, or cancer	• 33% reduction in TME 90 days post-enrollment • 55% reduction in average cost per day	• Increased patient satisfaction • greater likelihood of dying at home (2.2x higher)

Service Model

This in-home palliative care program was developed through partnership between a large staff-model managed care organization, Kaiser Permanente, and a non-profit community services organization, Partners in Care Foundation. Multi-disciplinary teams established long-term, stable relationships with patients with advanced illness and their informal and formal caregivers, and delivered in-home services—including pain management—to prevent patients and caregivers from relying upon ED and hospitalization when facing acute needs. Care teams included physicians, nurses, aides, social workers and therapists who coordinated and provided care, monitoring and treatment to patients. Importantly, patients did not have to waive curative treatment to enroll. Care could be supervised remotely and on-site in a patient's home as-needed, but always included active intervention to ensure that the home setting was adapted to support the needs of the patient. This model has since been deployed more widely within the Kaiser Permanente system.

Critical Success Factors

- **Multi-disciplinary care teams** include physicians, nurses, aides, social workers and therapists who coordinate and provide care, monitoring and treatment to patients
- **Early investment** in additional staff for physician and team home visits
- **Thorough knowledge of patient and caregiver needs and preferences**
- **24/7 availability** of nurses and social workers to assist in episodes of acute need

[25] Cohen S, Yu W. "The Concentration and Persistence in the Level of Health Expenditures over Time: Estimates for the U.S. Population, 2008-2009" *Agency for Healthcare Research and Quality*. 2012.

[26] Massachusetts Expert Panel on End of Life Care (2010). *Patient-Centered Care and Human Mortality: The Urgency of Health System Reforms to Ensure Respect for Patient' Wishes and Accountability for Excellence in Care.*

[27] Obermeyer Z, Clarke AC, Makar M, Schuur JD, Cutler DM. Emergency Care Use and the Medicare Hospice Benefit for Individuals with Cancer with a Poor Prognosis. Journal of the American Geriatric Society, 2016.

SAI & EOL Model II: Advanced Illness Management (AIM) Program (Sutter Health) and Home-Based Palliative Care Program (HomeConnections)

Target Populations	Cost Impacts	Secondary Impacts
• Severely ill patients • Chronically ill patients • Patients at end of life	• $2K saved per patient per month • 37% lower TME (PMPM) in last 3 months of life • 68% decrease in hospitalizations over 30 days post-enrollment • 52% Savings per member in last 2 weeks of life	• Increased patient preference over direct referral to hospice • Increased in early provider referrals to Palliative care as alternatives to hospice • More than double the rate of acceptance of hospice when needed (47% vs 20%) • Increased patient acceptance of hospice (70% vs 25% for usual care) • Increased LOS in hospice (median 34 days vs 9 days for usual care)

Service Model

The Advanced Illness Management (AIM) Program was developed by large non-profit integrated delivery system, Sutter Health. This model is similar to SAI & EOL Model I in its use of coordinated, multi-disciplinary delivery team for in-home care; identification initially occurred upon discharge from hospital, and then broadened to include direct physician referrals. The AIM Program is distinct from SAI & EOL Model I, however, in that it targeted all patients with advanced illnesses.

The Home-Based Palliative Care Program, HomeConnections, shared many components with the AIM Program, but differs in that they leveraged a partnership with a Carrier to achieve scale. HomeConnections was developed through partnership of a non-profit hospice, the Center for Hospice & Palliative Care, with a private non-profit commercial insurance company, Independent Health, in northwestern New York state. The Program targeted services to adults with advanced chronic illness or chronic pain, prior to need and eligibility for hospice.

Critical Success Factors

- *(Includes all Critical Success Factors from SAI & EOL Model I)*
- **Early enrollment** prior to end-stage engages patients early and avoid stigma around EOL label
- **Targets wider cost-drivers** by opening patient eligibility to patients who are not terminal but have severe, chronic conditions
- **Business model for health system** must support sustainability despite losses due to lack of reimbursement for AIM-type services in PPO plans
- **Carrier partnership with PMPM reimbursement** for Home Connections services helped support sustainability

SAI & EOL III: Oncology Medical Home (Consultants in Medical Oncology and Hematology)

Target Population	Cost Impacts	Secondary Impacts
Patients with oncology diagnoses	• 68% decrease in ED visits/patient receiving chemotherapy • 51% reduction in inpatient admissions per patient per year • 34% increase in hospice LOS	• Increased patients dying at home (to 74%) • Increased adherence to national guidelines (to >95%) • Increased patient calls resulting in symptom management at home (to 75%) • Increased patient and clinical team satisfaction

Service Model

This program was developed by Consultants in Medical Oncology and Hematology (CMOH), a private practice in southeastern Pennsylvania. Each patient was managed by a physician-led care team, which operated as the central coordinator of care throughout all phases of treatment, including surgery, radiation therapy, chemotherapy, and later survivorship. Many non-oncologic medical issues continued to be managed by the patient's PCP. Customized software was developed by CMOH as an oncology-specific EHR, allowing for standardized collection and analysis of data, and standardized protocols for symptom management. Patient navigators were responsible for gathering clinical data, scheduling tests and appointments with clinicians, and directing patients to community support services. This model merged workflow and clinical decisions, strengthened medication reconciliation, and promoted shared decision-making and end of life care.

Critical Success Factors
• **Multi-disciplinary teams** practicing increased communication with patients, and coordination of treating physicians • **Adherence** to nationally accepted, **evidence-based standards** of treatment • **Support for patient self-management** to avoid disease- and treatment-related complications • **IT systems** supporting electronic prescribing, CPOE, test and referral tracking, patient compliance monitoring, web portals for patient-provider communication, tracking of guideline adherence at physician and practice level, and performance measurement • **Patient navigators** coordinating evaluation and services, with emphasis on patient education, engagement and compliance • **Broadened access** with extended hours, telephone triage, and on-call physicians

Resources

Model I

Brumley, Enguidanos, et al. "Increased Satisfaction with Care and Lower Costs: Results of a Randomized Trial of In-Home Palliative Care." *JAGS, v.55* (2007): 993-1000.

Global Lab for Innovation. "Innovation Profile: In-Home Palliative Care." UCLA Health, 2014. PDF

Behm B. "A Synthesis of Home-based Palliative Care on Clinical Effectiveness, Cost-effectiveness and Quality of Life: Policy Implications Explored." Georgia State University, 2015. PDF.

Model II

Harris Meyer. "Changing The Conversation In California About Care Near The End Of Life." *Health Affairs v. 30.3* (2011): 390-393. Web

Kerr, Donohue, et al. Cost Savings and Enhanced Hospice Enrollment with a Home-Based Palliative Care Program Implemented as a Hospice-Private Payer Partnership*, Journal of Palliative Medicine*, *v.17.12* (2014):1328-1335.

Global Lab for Innovation. "Innovation Profile: In-Home Palliative Care." UCLA Health, 2014. PDF

Model III

Sprandio, J. "Oncology patient-centered medical home and accountable cancer care." *Community Oncology v. 7.12* (2010): 565-572. Web.
Global Lab for Innovation. "Innovation Profile: Oncology Medical Homes." UCLA Health, February 2014. PDF.

For links to these and other resources, please see the Innovation Investments page at mass.gov/hpc

Site & Scope of Care (SOC):

Expand scope of care of medical and paramedical providers who can most efficiently care for high-risk / high-cost patients in community settings (e.g., through care models, partnerships, or technologies)

The Massachusetts health care system is characterized by disproportionately high use of high-intensity care settings. Residents of the Commonwealth both access care in hospital-based setting more than national averages and utilize major teaching hospitals and academic medical centers rather than community hospitals than other states. There are opportunities to move volume to lower-priced, lower-acuity, community-based settings.[28]

Despite having relatively high percentages of residents reporting a "usual source of care," Massachusetts has roughly 500,000 residents living in federally-defined Health Professional Shortage Areas based on numbers of PCPs in an area. Access to care, especially for Massachusetts' Medicaid-eligible and underserved populations, is variable and a factor in increased health care costs. Analysis of a 2014 CHIA-conducted survey of more than 4,000 Massachusetts households found that among respondents who had been to the ED in the past year, over half had done so because they could not get an appointment at their usual source of care. Despite emerging evidence of similar outcomes and quality at lower costs, deploying alternative providers of health services and navigation (e.g., NPs, PAs, social workers, Paramedics, Community Health Workers, PCAs, or Peer Recovery Support Specialists) with appropriate professional oversight, remain inconsistently utilized. Studies have shown, for instance, comparable quality of care between NPs and primary care physicians across all domains that have been measured. NPs provide care at lower costs, and are more likely to treat Medicaid patients and practice in rural areas.[29] Mobile integrated health (MIH) models, furthermore, have emerged across the country as an important approach to shifting site and scope of care to reduce costs. MIH models address overutilization of EDs and hospitals, bring care closer, or into patients' homes, and enhance access by expediting entry into appropriate care settings (e.g., direct transport to behavioral health facilities).

Advancing technology also provides new opportunities to broaden the capabilities of community-based care without fragmenting service delivery. For lower-acuity conditions, comprehensive care to assist in managing chronic conditions or low-acuity episodes of care within a patient's community, via in-person or via telehealth, often offers a better patient experience, and reduces ED visits and hospitalizations, which has a significant impact on health care costs.

To address this Challenge, a number of innovations are emerging in the field. The following highlights a selection of innovative models that have successfully demonstrated cost savings. This summary is non-exhaustive, and should be considered an illustrative resource, only.

SOC Model I: Mobile Integrated Health Care (MedStar EMS; MN Community Paramedicine)

Target Populations	Cost Impacts	Secondary Impacts
• All adult patients calling 9-1-1 with medical conditions related to chronic disease(s) • High-risk patients with CHF	• 58% reduction in ED visits • 45% reduction in hospital admissions • 84% reduction in ambulance use one year post-graduation • ~ $8.5K savings per patient per year	• Increased patient satisfaction • Increased access to appropriate care for mental health, inebriated and low acuity patients • Reduced preventable EMS and ED use among high utilizer groups, reducing preventable 30-day CHF hospital readmissions, reducing preventable observation admissions, and reducing voluntary hospice dis-enrollment.

Service Model

MedStar, a large regional integrated delivery system in Fort Worth, Texas, developed an EMS-Based Community Paramedicine program in which Emergency Medical Technicians (EMT) and other ambulance crew members assumed tasks such as delivering community-based primary care, assessing patients' eligibility for redirection away from the ED, providing patient navigation services, and delivery of post-discharge follow up care and monitoring. These mobile integrated health programs included provision of telephone advice to emergency callers instead of resource dispatch, community paramedicine care, chronic disease management, preventive care or post-discharge follow-up visits, and transport or referral to a broad spectrum of appropriate care settings, not just hospital EDs.

Minnesota Medicaid and Hennepin Health have implemented community paramedics since the late 1990s. Community

[28] Massachusetts Health Policy Commission. *2014 Cost Trends Report.* Boston: 2015. Web.

[29] Massachusetts Health Policy Commission. *2015 Cost Trends Report.* Boston: 2016. Web.

paramedics have provided health assessments, immunizations and vaccinations, chronic disease monitoring and education, collection of lab specimens, medication compliance checks, hospital discharge follow-up care and minor medical procedures approved by a medical director. Through oversight rules vary state by state, community paramedics generally must work under the supervision of a physician medical director.

Critical Success Factors

- **New care and referral pathways** for urgent low acuity medical conditions
- **24/7 availability** of a nurse-staffed phone-line provides assessment, clinical education, triage and referrals
- **Paramedics trained to perform in-home delegated tasks** to improve transition of care from hospital to home, point of care lab tests, and improve care plan adherence
- **Ambulance transport provides alternative disposition** including transport of psychiatric patients directly to mental health facilities, inebriated patients to detoxification centers, and low acuity patients to urgent care centers

SOC Model II: Community Health Worker Program (UVA Medical Center)

Target Population(s)	Cost Impacts	Secondary Impacts
• Patients with chronic care needs • Patients with low acuity episodic care needs	• 35-50% reduction in unneeded ED visits and hospital readmissions • 62% of drop-in visits at a PCP clinic averted	• Increased patient satisfaction • Increased access to primary care services • Reduced specialist consultations and associated tests and interventions • Improved workforce development pipeline

Service Model

The University of Virginia School of Medicine developed this CHW program, now commercialized by Grand-Aides, Ltd. Grand-Aides' health care workers operated under the direct supervision of nurses, and were trained and equipped to conduct primary care office and ED consultations, provide telephone consultations and make primary care home visits to patients who might otherwise have been seen in emergency departments and clinics. Grand-Aides were typically individuals with prior medical training (e.g. medical assistant, certified nurse aide, community health worker) who had been trained with a standard curriculum to be an extender for a nurse, nurse practitioner, PA or physician; typically, 5 Grand-Aides were supervised by one nurse or other professional. Grand-Aides utilized standardized training programs and curriculum specific to many diagnostic groupings and care settings, and formed protocols for nurse supervision, quality assessment, continuing education, financial projections and tracking, and analytics for program performance. A typical program can be implemented within 4-6 months and realize savings within the following 6 months.

Critical Success Factors

- **Standardized, customizable curricula** and training programs
- **Data collection and analytics requirements** for tracking and measuring performance of the program
- **Standardized programs** for nurse supervision, quality assessment, and continuing education
- **Standardized patient satisfaction** measurement and analysis
- **Rapid learning** from other implementers of the model

SOC Model III: Hospital at Home (Johns Hopkins)

Target Population	Cost Impacts	Secondary Impacts
Patients with an acute illnesses, such as: • Heart Failure • Pneumonia • COPD	• 32% reduction in cost compared to acute hospital care • 35% reduction in LOS	• Improved patient experience • Increased access to hospitals, due to additional hospital capacity and resources available • Lowered risk of nosocomial infection and other complications

Service Model

The Hospital at Home (HaH) model was developed by Johns Hopkins School of Medicine, and has been expanded by a number of different health systems since its inception. The Johns Hopkins model focused on acutely ill Medicare and elderly VHA patients. Patients who were deemed eligible by the HaH selection criteria were offered in-home acute care as an alternative to hospitalization, and were transported home. The patient received nursing care during their initial "admission" to the home setting, and then had at least daily nursing visits based on their clinical needs. Nurses were available 24/7 by telephone or for a home visit for urgent needs. The HaH physician made an initial visit to assess the patient, and would then create a medical plan of necessary and appropriate diagnostic and therapeutic procedures. The physician made at least daily home visits, and was made available 24/7 by telephone or for a home visit for urgent needs. The physician used illness-specific care maps, clinical outcome evaluations, and specific discharge criteria to monitor the patient until they were stable enough to be discharged, and care transferred back to the patients' PCP.

In variations on the original pilot program, hospitals have partnered with home health agencies to provide diagnostics and monitoring systems with associated medical equipment and software to enable care in the home and support formal and informal caregivers. For-profit companies, such as Phillips, have developed integrated monitoring and coordination systems to support provider organizations operating versions of HaH. These models are predominantly staffed by in-home nursing and ancillary workers, and supported by physicians via telemedicine. HaH programs have also been extended to support early discharge of hospitalized patients in-home acute care programs.

HaH has previously only been implemented in a capitated reimbursement environment, where the holder of the risk – the payer, medical group, hospital, or health system – realizes the savings, but through a CMS Innovation Center challenge grant, the Icahn School of Medicine at Mount Sinai is testing a potential 30-day bundled payment model for fee-for-service Medicare.

Critical Success Factors

- **Clinician buy-in** to the HaH program as a whole
- **Fully staffed in-home acute care teams** comprising of a physician, nurse, and aides/Community Health Workers
- **Collaboration with home health and diagnostic services agencies**, or independent contractors to offer radiology and diagnostics that cannot be provided at home
- **Protocol in place for EDs, PCPs, and hospital clinicians** to offer eligible patients the HaH option, rather than hospitalization
- **Arrangement with Medicare, Medicaid, and commercial payers for bundled payments**, or other coverage terms to ensure reimbursement

Resources

Model I

AHRQ Health Care Innovations Exchange. "Trained Paramedics Provide Ongoing Support to Frequent 911 Callers, Reducing Use of Ambulance and Emergency Department Services." Agency for Healthcare Research and Quality. 2012. Web.

MedStar Mobile Healthcare. "Program Overview – Observation Admission Reduction." PDF.

Global Lab for Innovation. "Innovation Profile: Community Paramedics." UCLA Health, 2014. PDF.

Model II

Garson A, Green D, Rodriguez L, Beech R, Nye C. "A New Corps Of Trained Grand-Aides Has The Potential To Extend Reach Of Primary Care Workforce And Save Money." *Health Affairs, v.31.5* (2012):1016-1021. Web.

Garson, A. "New Systems of Care Can Leverage the Health Care Workforce: How Many Doctors Do We Really Need?" *Academic Medicine, v.88.12*. 2013. Web.

Global Lab for Innovation. "Innovation Profile: Nurse Extender Clinical Aides." UCLA Health, 2014. PDF.

Model III

Global Lab for Innovation. "Innovation Profile: Hospital at Home Model for Acute Care." *UCLA Health*, 2014. PDF.

Leff B, Burton L, Mader S, et al. "Hospital at Home: Feasibility and Outcomes of a Program to Provide Hospital-Level Care at Home for Acutely Ill Older Patients." *Annals of Internal Medicine, v.143* (2005): 798 – 808. PDF.

The Hospital at Home Organization website. "A typical Hospital at Home program follows these steps." 2012. Web.

For links to these and other resources, please see the Innovation Investments page at mass.gov/hpc